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Contributing Secured Session with Less Traffic Using Device-To-Device Communication for Social Networks

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Abstract: Managing sessions for individual users in the current networking environment is a very big task. Networks and sub-networks are playing major role in current evolving networking world. Consider five devices using internet via the sixth device in a network and they all are using same application with unique user id. It should not be mismatched with the data and user id in that network as there is confusion between devices and IP from the Server. And also it will occur unwanted traffic due to accessing same data by multiple users repeatedly. It is proposed a better method to manage the traffic and user's session security.

Keywords: Device-to-Device communication, social networks, Mobile social network.

1. INTRODUCTION

Mobile communication systems can be implemented by either cellular networks or ad hoc networks. In a cellular network, direct communications between mobile devices are not permitted. Traffic should be routed via a core network even if a source and a destination are very close to each other. Comparably, in an ad hoc network, devices can communicate with each other directly without a centralized controller [1], which is referred to as device-to-device (D2D) communications. Enabling additional D2D communications in cellular networks has become an interesting research topic the efficiency of a cellular system can be improved by exploiting high channel quality of short-range D2D links.

The other advantages of introducing D2D communications to a cellular system include prolonged terminal battery life due to reduced transmission power [2], more efficient resource utilization because of direct routing of D2D traffic [2], improved content distribution performance by using inter-recipient transmissions, etc. Wireless multicast transmission, as an efficient way to disseminate the same content simultaneously to multiple recipients [3], is well suited for supporting the applications such as mobile TV and data distribution in cellular systems.

However, the recipients of wireless multicast may experience very different channel conditions, making it hard for a multicast sender [4], i.e., a base station (BS), to transmit data at a rate suitable for all recipients. In most cases, a multicast rate is selected according to the worst channel condition to assure successful reception at every recipient. As a result, the achievable multicast throughput may degrade significantly [4], especially when most but not all recipients are in good channel conditions and capable for high rate transmission, as one or very fewer poor recipients may become a bottleneck of the multicast throughput.

2. RELATED WORK

Social Network Aware Device-to-Device Communication in Wireless Networks

This paper uses the algorithm names Proposed Traffic Offloading Algorithm (TOA). In this model the network users are categorized into two types one is frequent user and normal user. The frequent user is the one who is continuously using the network. These frequent users are cause for the more traffic in the network. And they cannot be avoided to maintain usability. The second type is the normal user, these users and mostly seems to be in offline. When these users tries to login to the social network the data has to be delivered to his device. To reduce traffic the existing propose the Traffic Offloading Algorithm, this algorithm runs in every social network app and categorize the app and device to any one type of user [6]. Then this algorithm will use the frequent user's node as centric node [7]. So all the data for the social network usage will load to those nodes and from those nodes the data transmitted to offline nodes.

A design approach for intra cluster device-to-device communication with minimal resource utilization

In this paper, the author described about intra cluster device-to-device communication with minimal resource utilization. A cellular network with D2D communications, which is most likely to be adopted in the next releases of 3GPP Long Term Evolution Advanced (LTE-A) defined by ITU under the scope of IMT-Advanced. As shown multiple mobile devices located nearby form a D2D cluster. D2D cluster formation procedure is under the control of a BS. If a device wants to join a nearby cluster, it first sends a request message to the BS. With a grant from the BS, the device then starts D2D channel probing process which checks to see whether it has sufficiently good direct D2D connections with the cluster members to support intra-cluster communication. The devices that can

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and cannot correctly decode data are referred to as "ACK-devices" and "NACK-devices", respectively. As the distances between D2D sender/receiver pairs are usually relatively short, intra-cluster D2D communication is expected to proceed at a much higher achievable data rate than those between the BS and mobile devices.

3. PROPOSED DESIGN

This project proposes the better method and algorithm to overcome the problems faced in the existing system. To provide the security and also to reduce traffic, the existing system is just modified with the proposed method **Service Based Data Delivery Algorithm (SBDDA),** in this proposed method instead of categorizing users based on the usability and they are categorized based on the services. The social network Apps are designed to load data as a service file not as the data. It is lightweight compared to the normal transmission. The data is packed as the service file and transmitted over the network to the client. This SBDD algorithm also cares about security of data over the network by encoding it and to reduce the file size. It compresses the file size before sending to client. In this proposed design, light weight protocol is used. So there is no delay in transmission. The encoding scheme used in this method provides data security. Data is not depending on other nodes and so it does not drains other node's battery. As the light weight service file is used for transmission of data the traffic is reduced.

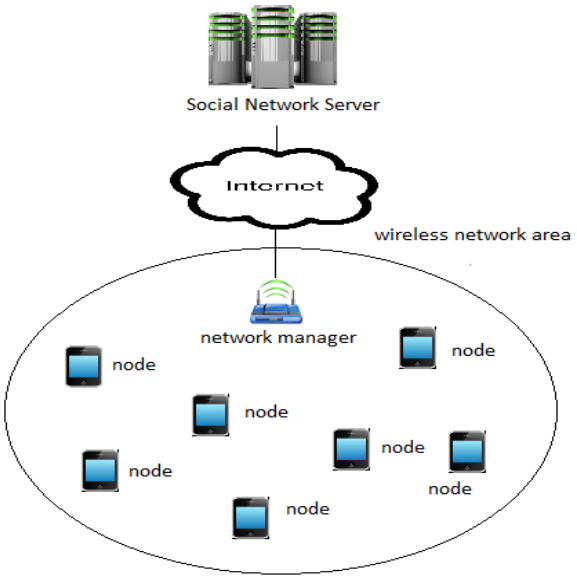

Fig1. Topology design

DATA SERVER IN BASE STATION

It is act as the data server in base station, it has the responsibility to accept client request and serve data. It authenticates the client nodes for communication and holds its information like IP, MAC, service ID and node movement pattern. It uses the Service Based Data Delivery Algorithm (SBDDA) to handle network nodes by getting node information from network server. To connect to a server, the client must be able to communicate with it over the network. Computers connected to the Internet typically communicate using TCP/IP (Transmission Control Protocol and the Internet Protocol). TCP/IP allows different types of computers to communicate at a low level; it is up to applications, however, to determine how client and server software talk to each other. Many routing process has discussed in the history of network to improve its performance and many methodology has been promoted. Even though there has been number of protocols implemented for wireless network efficiency is not improved in wireless mobile network for the mobile social network.

NETWORK MANAGEMENT AND CONTROLLING

It is responsible for forming a network. It allots IP and resource for nodes under network and collects the node's information. It also controls and monitors the node's communications by allotting bandwidth for every data transmissions. The every movement of the nodes are traces by this network manager for travel history which can be used for analysis. Network Manager continuously monitors the response time of multiple devices. It updates the system details, such as System Name, System Description, and System Location in a range of devices. The status of the ports can be either listening or not listening. We can associate the ports with the known services, which enables you to know the unknown/unwanted services running in the system.

SOCIAL NETWORK CLIENT NODE COMMUNICATION

It acts as the client node in our simulation network. It enters into the network as a network node and sends the connection request to the network manager. Then randomly it acts as the social network client and asks for service data to the data server. Then it receives that data via D2D communication from that data server with the allotted bandwidth.

SESSION HANDLING AND CONTROLLING TRAFFIC

The process runs under SBDD algorithm which controls the server and client nodes session under communication. It is responsible for security and connection individuality. Session manager identifies the nodes service request and categorizes the nodes for social network communications. The data to be transmitted to the client from server will be transmitted using D2D communication only through the social network devices. The Algorithm proposed to reduces the unwanted traffic in the network and provided network and data security. It also performs data binding operation to reduce the data weight while on communication.

TRAFFIC ANALYZING AND MONITORING

This module runs throughout the entire simulation which used to records the rate of data transmission and traffic between the nodes communications. This traffic rate is plotted as graph to find the variation in the rate of data transmission and traffic level in the network. Traffic monitoring and analysis is essential in order to more effectively troubleshoot and resolve issues.

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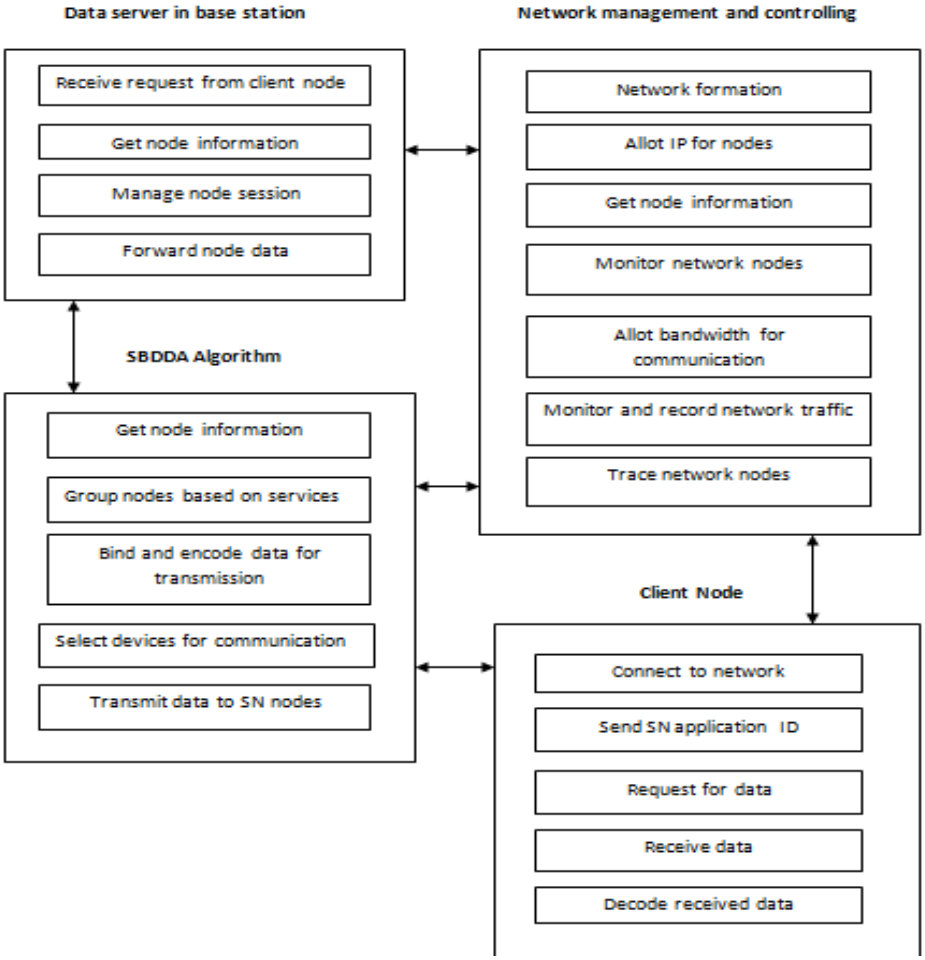

Fig2. Block diagram

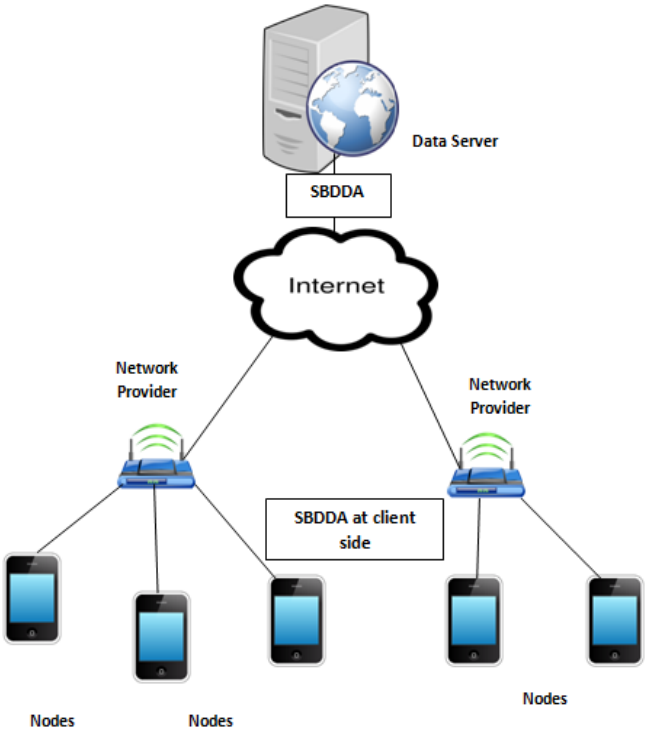

Fig3. Functional design

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4. PROPOSED SBDD ALGORITHM

Initially the network manager starts the network, and then network manager accepts the new connections from the network nodes. Secondly the network manager collects the node information like node ID, node IP, node's Position and node's Services. And then it categorizes the nodes into groups based on the services they running. Then the network node groups are considered as the hops. Hops are the group of nodes in the network. And then the client allows the node to request the service from the server node, where server is also a member of the Network. Based on the service the routing path is calculated based on the information collected from the Network. It is responsibility of the SBDDA algorithm with act as the part of the routing algorithm calculates this routing path for the nodes. The data to be send to the client nodes is calculated and bind into XML element rather than the data packets. Then the XML element is send along with the routing path to the network nodes.

STEP 1: Get the network node's information.
STEP 2: Group the nodes by service.
STEP 3: Get the request.
STEP 4: Get the data.
STEP 5: Bind and encode data.
STEP 6: Decide the network route.
STEP 7: Forward data to the social network nodes.

```
1. procedure START_NETWORK ():
a. while True do
   i. number_of_nodes□ getNodeInformation()
  ii. node_ID[]□ getNodeID()
 iii. node_IP[]□ getNodeIP()
 iv. node_MAC[]□ getNodeMAC()
  v. node_BandWidth[]□ getNodeBandWidth()
 vi. node_BufferCapacity[]□ getNodeBufferCapacity()
vii. hops□ NetworkCoverage/distance(source,destination)
viii. Set□ NR//number of routes
 ix. for node in network:
      1. for service in nodes:
      a. for connection in service:
   i. if node in serviceList and valid(node) then
      1. do
      a. set_as_routing_node(node)
      b. nodes[]□ node
      2. endif
  x. apply_DSR(nodes[])
 xi. bytes[]□ getBytes(DATA)
 xii. while !EndOfBytes
      1. do
      a. for byte in bytes[]
   i. packet[]□ byte
  ii. send(RReq)
 iii. if accepted(RReq) then
      1. do
      a. forward(packet)
      2. endif
 iv. get(RRes)
  v. if negative(RRes) then
      1. do
      a. resend(packet)
 vi. endif
      2. end_of_procedure
```

5. RESULT AND DISCUSSION

The performance of the routing and data of SBDDA algorithm in D2D network depends on the efficiency of various challenges from several dimensions such as human mobility, community structure, user selfishness, context information, etc. In light of the work on D2D network focusing on its various aspects, there are still several questions and problems left without any proper answer.

Data Deliver: However, incremental community detection techniques could find a sequence of communities with temporal similarity and hence, is suitable for MSNs with the community structures that are more stable over time. As such, an incremental community mining approach which considers both current and historic information into the objective of mining processes. Nevertheless, new algorithms should be developed to detect the evolution of

communities in highly dynamic MSNs. One potential solution is the identification of critical events and transitions for the evolving social communities.

Traffic control: Effectiveness is defined as, for a protected station, in the application layer, the ratio between throughput of the uplink traffic in protected mode and the throughput of the uplink traffic in normal mode. Protected mode means that AP allocates medium resource to this uplink traffic by different mechanisms, while normal mode means that AP works normally without running any mechanism it is propose.

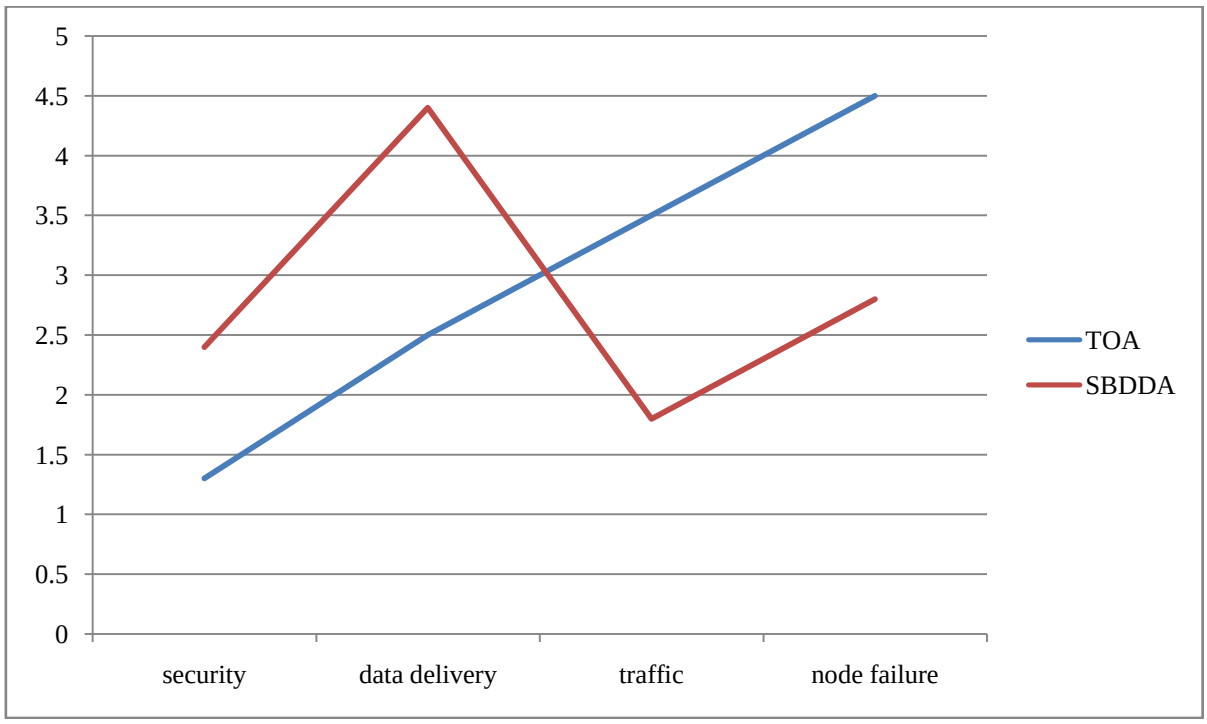

Fig4. Simulation graph

6. CONCLUSION

Mobile social networks (MSNs) are modern types of social media, which consolidate the ability of a present connection for mobile devices to share user-centric data objects among interested users. However the current SBDDA provide the better routing in a mobile social network this can be still improved for the future increasing network. The development can be made on the factors of node's speed, node's pause time, network size, number of traffic sources and routing protocol. And the performance is calculated via average throughput, average routing overhead and power consumption. So this proposed model can adopt lager network along with the faster node updating algorithms like DSDV. This can be also used to avoid the node's pause time that is caused because of the routing loops. As this model can avoid traffic sources by performing routing in community network by eliminating other unwanted nodes the effective use of the bandwidth is achieved. Thus there is less traffic in the implemented model the throughput rate is higher and routing overhead is improved for better network.

REFERENCES

[1] L. Song, D. Niyato, Z. Han, and E. Hossain, Wireless Device-to-Device Communications and Networks. Cambridge, U.K.: Cambridge Univ. Press.

[2] "Cisco visual networking index: Global mobile data traffic forecast update," Whitepaper, vol. 10, no. 8, pp. 2752–2763, Feb. 2011.

[3] T. Q. S. Quek, G. de la Roche, I. Guvenc, and M. Kountouris, Small Cell Networks: Deployment, PHY Techniques,and Resource Management. Cambridge: Cambridge Univ. Press, Apr. 2013.

[4] C. H. Yu, K. Doppler, C. B. Ribeiro, and O. Tirkkonen, "Resource sharing optimization for device-to-device communication underlaying cellular networks," IEEE Trans. Wireless Commun., vol. 10, no. 8, pp. 2752–2763, Aug. 2011.

[5] C. Xu, L. Song, Z. Han, D. Li, and B. Jiao, "Resource allocation using a reverse iterative combinatorial auction for device-to-device underlay cellular networks," in Proc. IEEE GLOBECOM, Anaheim, CA, USA, Dec. 3–7, 2012, pp. 4542–4547.

[6] M. Cha, H. Kwak, P. Rodriguez, Y. Y. Ahn, and S.Moon, "I tube, you tube, everybody tubes: Analyzing the world's largest user generated content video system," in Proc. 7th ACM SIGCOMM IMC, San Diego, CA, USA, Oct. 2007, pp. 1–14.

[7] B. Xing, K. Seada, and N. Venkatasubramanian, "An experimental study onWi-Fi Ad-Hocmode formobile device-to-device video delivery," in Proc. IEEE INFOCOM, Rio de Janeiro, Brazil, Apr. 20–25, 2009, pp. 1–6.

[8] M. Zulhasnine, C. Huang, and A. Srinivasan, "Efficient resource allocation for device-to-device communication underlaying LTE network," in Proc. 6th IEEE Int. Conf. WiMob, Niagara Falls, ON, Canada, Oct. 11–13, 2010, pp. 368–375.

[9] T. Koskela, S. Hakola, T. Chen, and J. Lehtomäki, "Clustering concept using device-to-device communication in cellular system," in Proc. IEEE WCNC, Sydney, NSW, Australia, Apr. 18–21, 2010, pp. 1–6.

[10] N. Golrezaei, A. F. Molisch, and A. G. Dimakis, "Base-station assisted device-to-device communication for high-throughput wireless video networks," in Proc. IEEE ICC, Ottawa, ON, Canada, Jun. 10–15, 2012, pp. 7077–7081.